

(No Model.)

2 Sheets—Sheet 1.

W. P. BUCHAN.

VENTILATOR.

No. 288,004.

Patented Nov. 6, 1883.

Fig. 1.

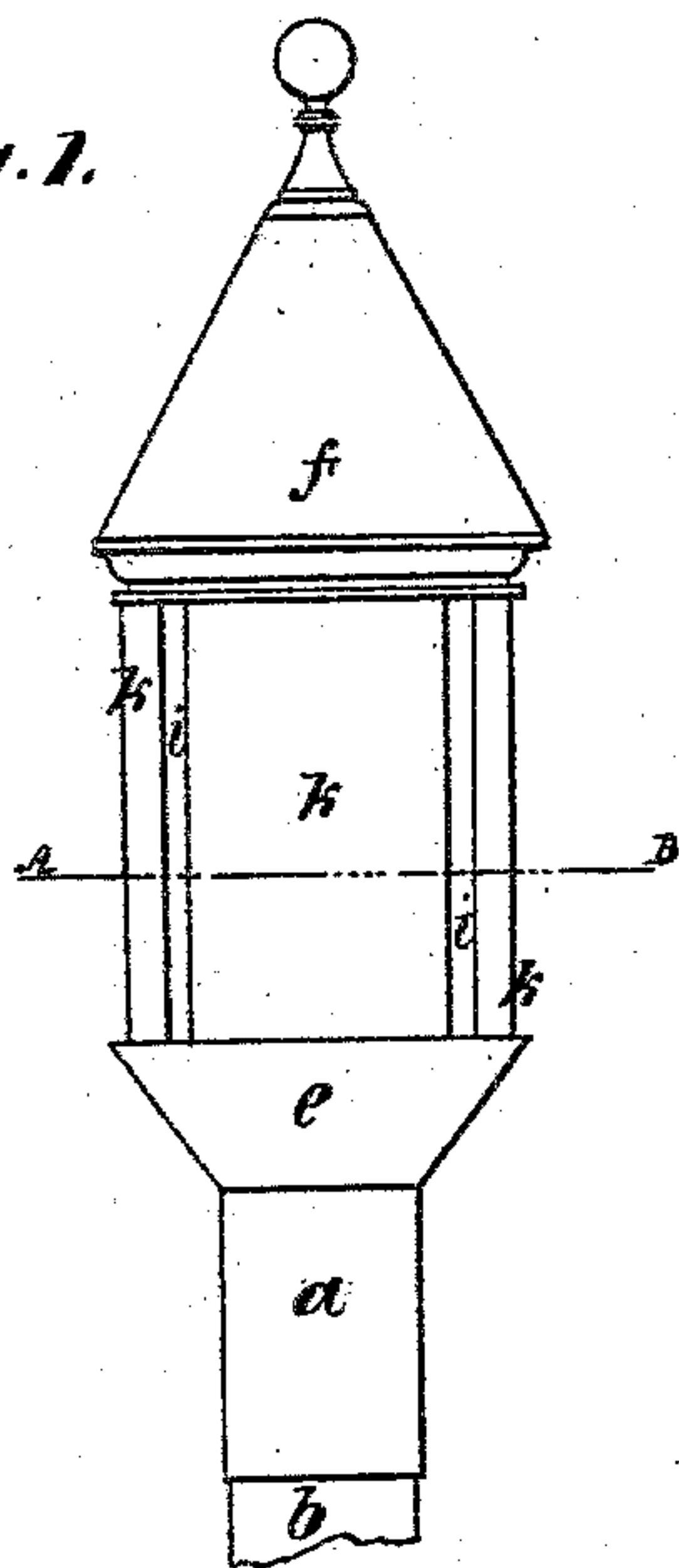


Fig. 2.

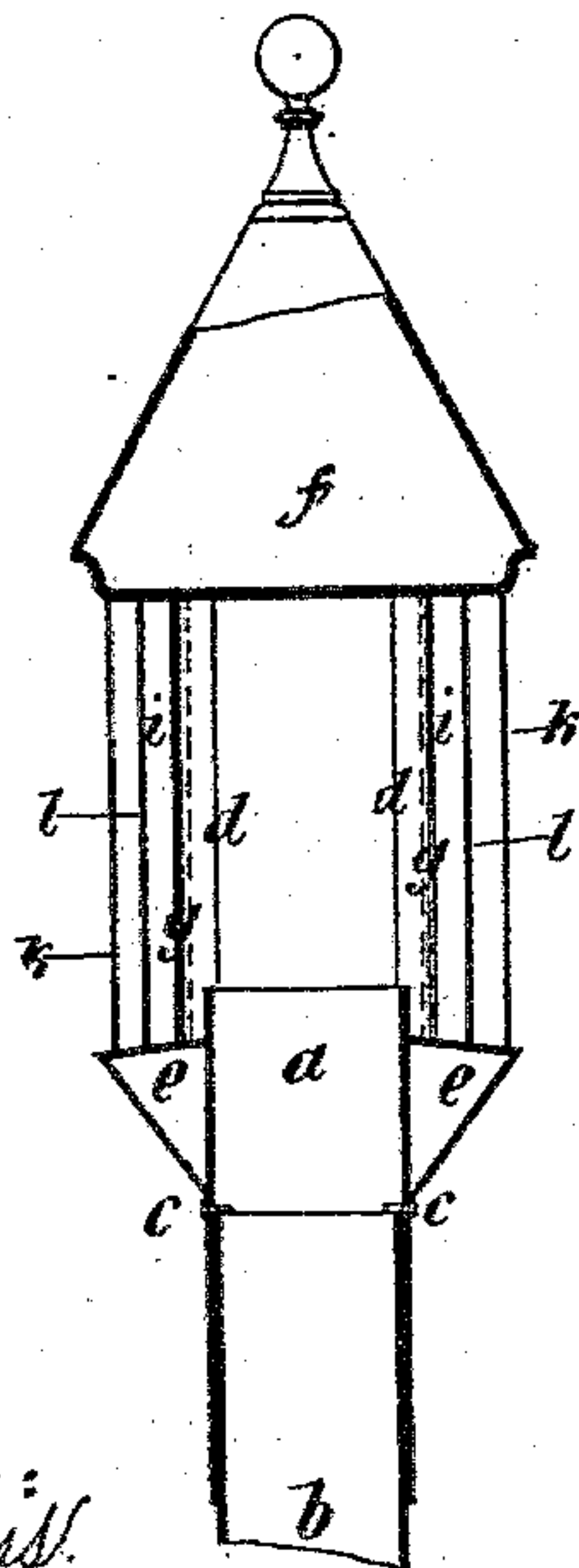


Fig. 3.

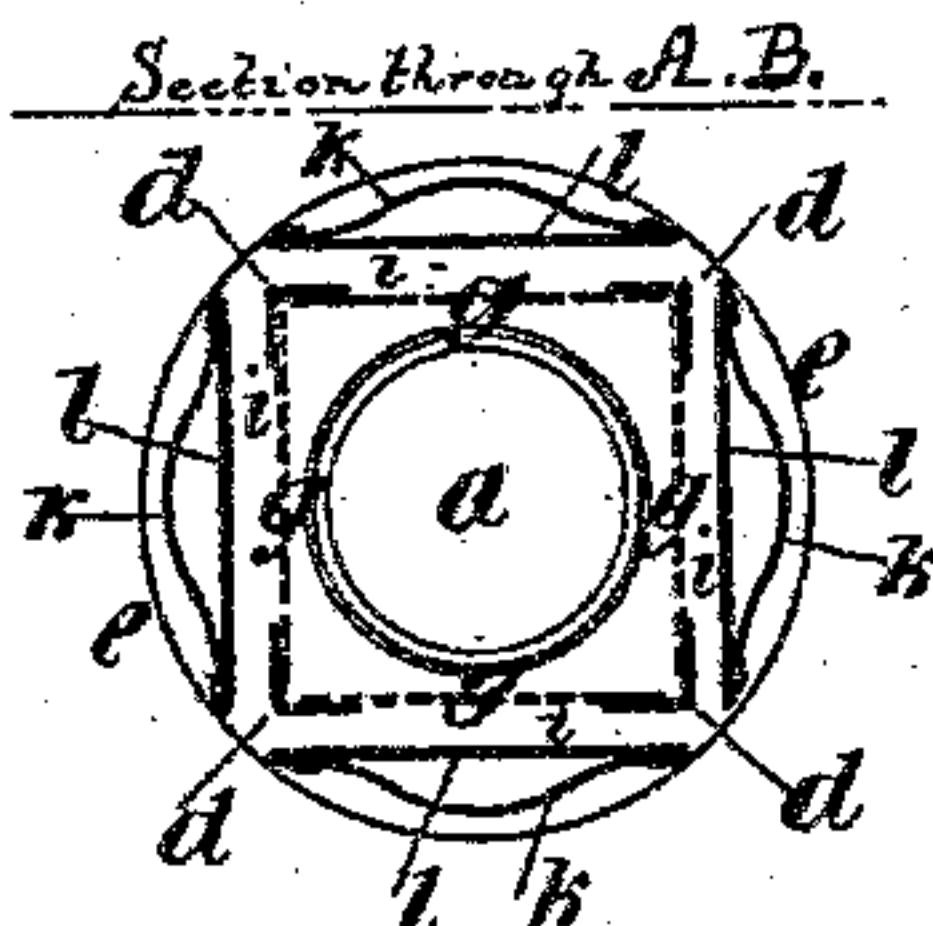


Fig. 4.

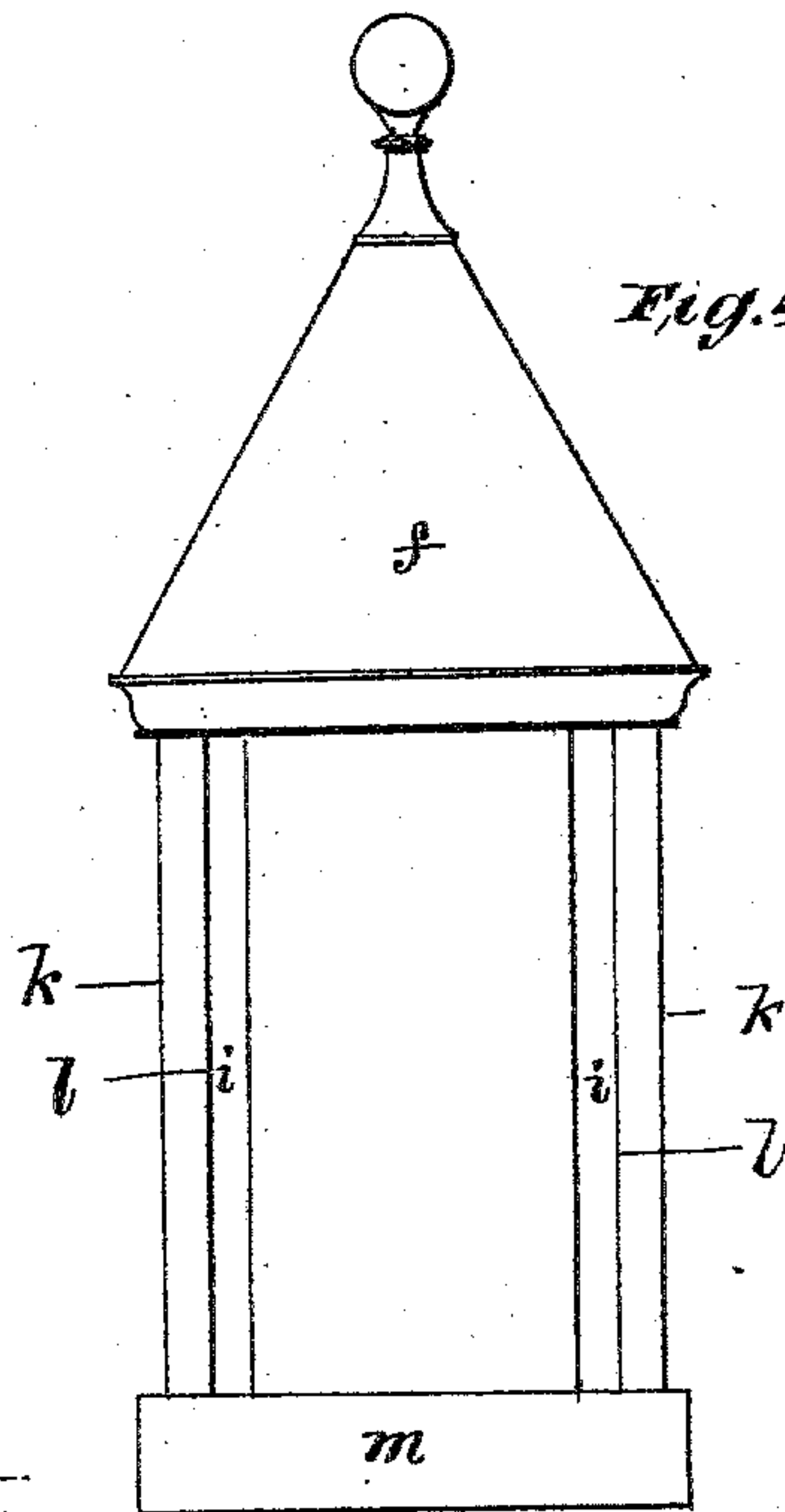
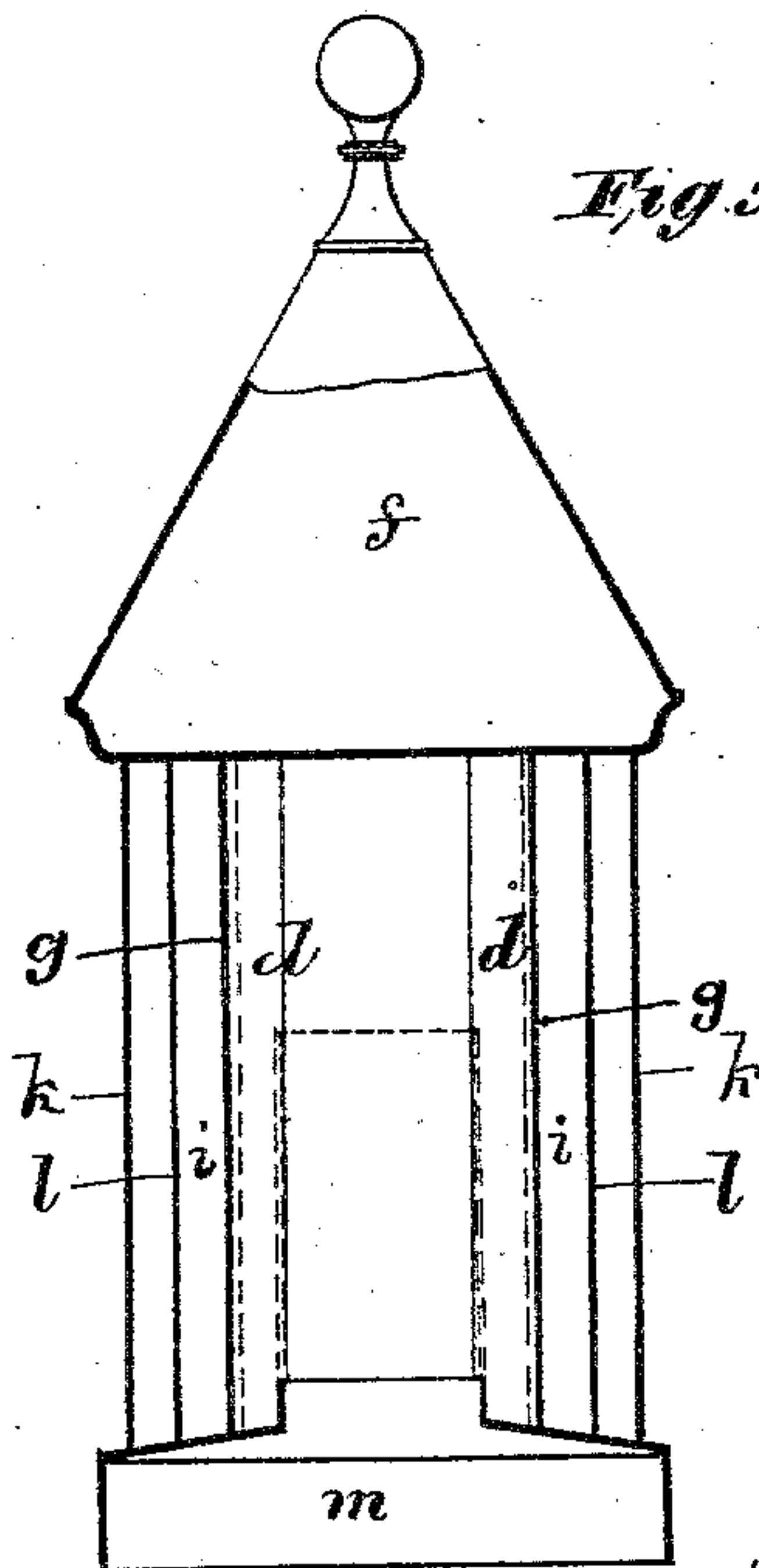


Fig. 5.



Attest:
J. F. J. J. J.
Charles B. B. B.

Inventor:
Wm. Paton Buchan,
By Wright & P. Attys.

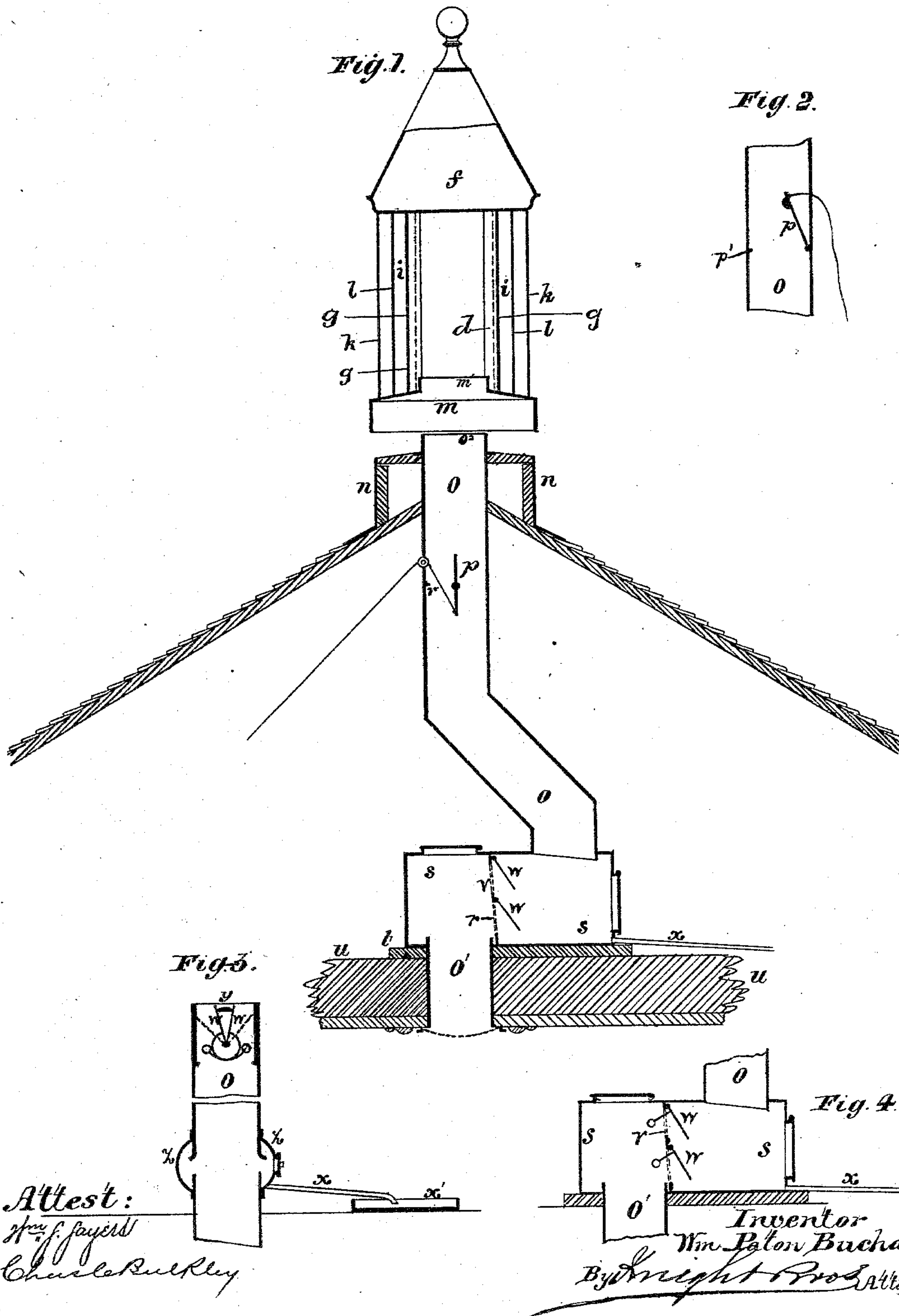
(No Model.)

2 Sheets—Sheet 2.

W. P. BUCHAN.
VENTILATOR.

No. 288,004.

Patented Nov. 6, 1883.



UNITED STATES PATENT OFFICE.

WILLIAM P. BUCHAN, OF GLASGOW, COUNTY OF LANARK, SCOTLAND.

VENTILATOR.

SPECIFICATION forming part of Letters Patent No. 288,004, dated November 6, 1883.

Application filed March 14, 1883. (No model.) Patented in England July 9, 1878, No. 2,745.

To all whom it may concern:

Be it known that I, WILLIAM PATON BUCHAN, a citizen of Great Britain, residing at Glasgow, in the county of Lanark, Scotland, have invented certain new and useful Improvements in Ventilators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to improvements in apparatus or appliances for the better or more efficient ventilation of common sewers, drains, and the soil and waste-water pipes and traps of or connected with water-closets, sinks, bathrooms, or other parts of houses, as well as for the ventilation of the apartments of dwelling-houses, hospitals, prisons, schools, halls, churches, mills, workshops, stables, ships, and other structures from which it is desired or necessary to draw off foul or vitiated air or gases; and the invention consists in the employment for such purposes of a fixed cowl or ventilator of special construction, and wherein an upward or exhausting current is induced by the action of the wind in blowing upon and passing the ventilator, such upward induced current being capable of regulation or of being entirely cut off or stopped by arrangements of valves provided in conjunction with the ventilator.

In order that the said invention may be properly understood, I have hereunto appended two sheets of drawings illustrative of the construction of the improved ventilators, and the method in or under which they are or may be used or applied in practice.

On Sheet 1 of the drawings, Figure 1 is an elevation, Fig. 2 a vertical section, and Fig. 3 a horizontal section on the line A B, Fig. 1, of that form of the improved ventilator which I prefer to employ in the ventilation of soil and waste-water pipes of houses, drains, common sewers, and the like, but which may also be used in the ventilation of workshops, mills, stables, ships, and other structures, while Fig. 4 is a side elevation, and Fig. 5 a vertical section, of that form of the ventilator which I prefer to employ in the ventilation of the

apartments of dwelling-houses, hospitals, prisons, halls, schools, churches, and like structures, both of these ventilators, although shown of a plain form in elevation, being capable of any desired ornamentation.

On Sheet 2 of the drawings, Fig. 1 is a vertical section of my improved ventilator in connection with the ventilating-pipes of a building. Fig. 2 is a vertical section of pipe, showing a modified form of valve for stopping the passage of air. Fig. 3 is a vertical section of pipe, showing another form of valve. Fig. 4 is a vertical section of a modified form of valve-box.

The ventilator illustrated at Figs. 1, 2, and 3, Sheet 1, consists of an uptake-pipe, *a*, the lower end of which is slipped preferably over or outside of the upper end of the soil or waste-water pipe *b* of the house, or of a pipe communicating with the drain, common sewer, or other structure or way desired to be ventilated, and when the pipe *a* is slipped over the pipe *b* a series of pins or studs, *c*, are passed through the pipe *a*, so as to project at the inside, as seen at Fig. 2, and so act as a seat for and prevent the ventilator from slipping too far down on the pipe to be ventilated.

The upper end of the uptake-pipe *a* leads into a chamber, which is preferably square or rectangular in form, as seen at Fig. 3, and which is composed of four angle or corner pieces, *d*, extending from the sole or seat *e* to the head or hood *f*, the said sole or seat being preferably inclined or beveled outward, so as to throw off any water or moisture which may find its way into the interior of the ventilator.

The space between the angles *d* around the four sides of the chamber is filled in with wiregauze, perforated zinc or other metal, wood, or other suitable material, *g*, with the necessary perforations or air-passages left or made in it, and outside of the said square or rectangular chamber passages *i* are formed by vertical plates *l*, extending from the sole or seat *e* to the hood *f*.

On the outside of each of the plates *l* a plate, *k*, of curved or wave line form, as shown in horizontal section at Fig. 3, is secured, the plate being so curved or waved in order to enable the wind or air current to exert its maximum extractive or inductive power upon the ventilator.

The four outside wind-guards, *kl*, instead of being formed of one or two pieces of sheet metal or other sheet material, as indicated at Fig. 3, may each be made of one solid bar or block of metal, wood, or other material.

The improved induced-current fixed ventilator illustrated by Figs. 4 and 5, Sheet 1, of the drawings, is constructed and acts substantially in the manner hereinbefore described, and this form is preferred for situations where the uptake-pipe is not exposed or does not stand clear above the roof, and especially for larger sizes, where it is desired or intended that the ventilator should sit on a seat, being for this purpose constructed with a square, rectangular, polygonal, or round base, *m*, which, as seen in the figure of one style of application, Sheet 2 of the drawings, rests on a seat, *n*, made on the ridge of the roof; but in other cases the seat may be at one side of the ridge or at any other desired part of the roof.

The seat *n*, when of wood, is preferably covered with zinc, lead, or other sheet metal or protective substance, the base *m* of the ventilator being slipped over the said metal when on its seat. In the drawings the base is shown raised above the seat, as in the act of being placed in position.

When the ventilator is let down into its place, the upper end, *o*², of the uptake-pipe *o* slips into the short pipe *m'* of the base, the joint being made tight with red lead, putty, cement, cloth, or other material, and the ventilator is secured in position by screws or nails passed or driven into the seat *n*.

All wind-acting ventilators, owing to the inconstant and varying action and sometimes to the almost entire absence of their motive power, and to the counteraction from other causes—for example, of chimneys—are liable to downdrafts unless a self-closing or other valve be fixed upon or used in conjunction with them.

A valve-box, *s*, may be placed on the pipe *o*, as seen at Fig. 1, Sheet 2. The said box is shown resting upon a seat, *t*, placed on the joists *u*; but it may be placed directly on the joists, or in any other convenient situation, and it is divided interiorly into two parts by a perforated sheet, *r*, of zinc or other metal, or by a division having holes or passages through it. Opposite the said holes or perforations light flap-valves *w*, of metal, cloth, paper, mica, or other suitable substance, are placed, which valves, while the induced or upward current is maintained, are kept open by the action of the current on them; but when downdraft takes place the said valves close automatically, thereby shutting off the part *o'* of the uptake-pipe from the part *o*, and preventing downdraft into the building.

The upper end of the part *o'* is preferably situated slightly above the bottom of the box, to prevent the access of water or condensed vapor into the building through it, while the lower end of the upper part, *o*, of the uptake-pipe is preferably beveled or inclined, as shown, in order to afford greater facility for

water or condensed vapor dripping off therefrom into the valve-box, and to prevent the water or vapor so dripping off from touching the valves *w*. Any water deposited passes off from the valve-box through the pipe *x*, which may either lead onto the roof or into any suitable ram or other pipe, or into a tray, *x'*, as seen at Fig. 3, Sheet 2, where it is evaporated.

The valve-box is or may also be furnished with doors, to afford access for cleaning or other purposes to its two sections or parts.

When the valves *w* are of metal or other like material, they are balanced, as shown at Fig. 4, Sheet 2. Fig. 3 shows an arrangement in which the valve-box *s* is dispensed with, balanced metal valves being also in this case used. These valves are centered on a pin passing through a short length of pipe, which is slipped down or inserted into the uptake-pipe *o*, and may either rest upon a seat therein or be otherwise secured. The weights are prevented from opening the valves too far by a bar, *y*, extending across the said short section of pipe.

When valves made of metal or other hard substance are used, a cushion or pad of cloth, india-rubber, or other like material may be employed for them to strike against to prevent noise.

Instead of loaded metal valves being used in this arrangement, unloaded cloth valves or valves made of paper or other like substance may be employed; and to draw off any water or vapor which may condense in the pipe *o*, the lower part of the said pipe may have a slit or opening around it leading into a bulged part, *z*, from which the water is drawn off by the pipe *x*, hereinbefore referred to.

Any of the foregoing arrangements for preventing downdraft may also be applied to the form of the improved ventilator illustrated by Figs. 1, 2, and 3, Sheet 1, of the drawings, and in conjunction with any of the forms an air-injection pipe may be employed to produce an upward current in the uptake-pipes of the ventilator, such current being caused by forcing air through the injection-pipe by fanners driven by steam, hydraulic, electric, or other motive power; or a jet or jets of gas may be lighted inside the uptake-pipes when desired to cause or assist an upward current.

When the ventilator is to be used on board ship, the uptake-pipe *o* is preferably continued well up into the ventilator, as seen in dotted lines at Fig. 5, Sheet 1, to prevent the access of water into the said pipe.

In order to enable the ventilation or passage of air through the ventilating-pipe *o* to be stopped at pleasure, a valve, *p*, is inserted into the pipe, the said valve being centered on a spindle and furnished with a cord or chain for closing it, and a stop, *p'*, is provided to prevent the valve from going too far in closing; or, as seen at Fig. 2, when a rectangular pipe is employed, a self-closing loaded valve may be used, in which case the valve is opened, when it is desired to establish ventilation, by pulling

the cord or chain; or the valve may hang downward when open, in which case the cord or chain is employed to close it.

Having now described my said invention,
5 what I desire to claim and secure by Letters Patent is—

1. In a ventilator, the combination, with an uptake-pipe, of a suitable seat or base, a hood, corner-pieces extending between the seat or
10 base and hood, and plates *l*, convex on their outer side, as shown, and providing air-passages *i*, as set forth.

2. The combination, with a ventilator, of an

uptake-pipe, an inlet-pipe, and a valve-box located between said pipes, having a dividing-sheet, *r*, formed with openings, and flap-valves hinged to the sheet, as set forth.

In testimony whereof I have hereunto set my hand and seal this 1st day of March, in the year of our Lord 1883.

W. P. BUCHAN. [L. S.]

In presence of—

GEO. MACAULAY CRUIKSHANK,

T. R. ANDERSON,

Both of 135 Buchanan St., Glasgow.